

## CLAIMS

What is claimed is:

1. A compressor wheel comprising:

titanium;

5 a proximate end;

a distal end;

an axis of rotation;

a z-plane positioned between the proximate end and the distal  
end; and

10 a joint having an axis coincident with the axis of rotation and  
an end surface positioned between the z-plane and the distal end.

2. The compressor wheel of claim 1 wherein the joint is capable of  
receiving a balancing spindle and wherein a distal end of the balancing  
15 spindle extends beyond the z-plane.

3. The compressor wheel of claim 1 further comprising a balancing  
spindle positioned in the joint and having a distal end that extends beyond  
the z-plane.

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4. The compressor wheel of claim 1 comprising a turbocharger  
compressor wheel.

5. The compressor wheel of claim 1 wherein the end surface of the joint comprises an ellipse.
  6. The compressor wheel of claim 5 wherein the ellipse comprises a radius to height ratio of approximately 3:1.
  7. The compressor wheel of claim 1 wherein the compressor wheel comprises titanium alloy.
- 10 8. The compressor wheel of claim 1 wherein the joint comprises a proximate portion, an intermediate portion and a distal portion.
9. The compressor wheel of claim 8 wherein the distal portion comprises a diameter and a length of approximately 1.6 of the diameters.
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10. The compressor wheel of claim 1 wherein the peak principle operational stress of the compressor wheel occurs proximate to the end surface and proximate to the axis of rotation and does not exceed the yield stress.
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11. The compressor wheel of claim 1 wherein the end surface comprises approximately a full radius.

12. The compressor wheel of claim 1 wherein the joint is capable of receiving a compressor shaft and wherein a distal end of the compressor shaft does not extend beyond the z-plane.
- 5     13. The compressor wheel of claim 1 further comprising a compressor shaft positioned in the joint and having a distal end that does not extend beyond the z-plane.
- 10     14. The compressor wheel of claim 13 wherein the compressor shaft comprises a turbocharger shaft.
15. An assembly comprising:  
a compressor wheel, the compressor wheel comprising titanium, a proximate end, a distal end, an axis of rotation, a z-plane positioned between the proximate end and the distal end, and a joint having an axis coincident with the axis of rotation and an end surface positioned between the z-plane and the distal end; and  
a balancing spindle positioned in the joint and having a distal end that extends beyond the z-plane.
- 20     16. The assembly of claim 15 wherein the compressor wheel comprises titanium alloy.

17. An assembly comprising:

a compressor wheel, the compressor wheel comprising titanium, a proximate end, a distal end, an axis of rotation, a z-plane positioned between the proximate end and the distal end, and a joint having an axis coincident with the axis of rotation and an end surface positioned between the z-plane and the distal end; and

5 a compressor shaft positioned in the joint and having a distal end that does not extend beyond the z-plane.

10 18. The assembly of claim 17 wherein the compressor wheel comprises titanium alloy.

19. A turbocharger comprising:

an end opposite the distal end of the compressor shaft of the  
15 assembly of claim 17 positioned in a turbine joint of a turbine wheel.

20. A method comprising:

inserting a balancing spindle into a closed-end joint of a compressor wheel to a depth beyond the z-plane of the compressor wheel;

20 balancing the compressor wheel;

removing the balancing spindle; and

inserting a compressor shaft into the closed-end joint of the compressor wheel to a depth that is not beyond the z-plane of the compressor wheel.

- 5 21. The method of claim 20 wherein the step of inserting the balancing spindle to the depth beyond the z-plane includes stabilizing the compressor wheel for the balancing.